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Ground-glass opacities associated with pulmonary cysts

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A 28-year-old man presented with a three-day history of fever, cough, and progressive dyspnea. Chest CT showed diffuse ground-glass opacities containing pulmonary cysts (Figure 1).

Ground-glass opacity is perhaps the most common abnormal pattern seen on chest CT scans of individuals with lung diseases, making it an extremely nonspecific finding. The differential diagnosis of pulmonary cysts is more limited, although it still encompasses a considerable number of diseases. When the two patterns coexist, the list of diagnostic possibilities is greatly reduced.

The association of ground-glass opacities with pulmonary cysts can occasionally be seen in desquamative interstitial pneumonia and hypersensitivity pneumonitis. However, in those diseases, cysts are rare and, when present, are typically few in number. A history of contact with birds or fungi can indicate a diagnosis of hypersensitivity pneumonitis.

Hemorrhagic pulmonary metastases and traumatic pulmonary pseudocysts can also have similar imaging aspects when accompanied by pulmonary hemorrhage. The clinical history is generally sufficient to raise the diagnostic suspicion of those two diseases.

The two conditions that most often manifest as an association of ground-glass opacities with pulmonary cysts are lymphocytic interstitial pneumonia and *Pneumocystis jirovecii* pneumonia (pneumocystosis).

Lymphocytic interstitial pneumonia is commonly seen in individuals infected with HIV, those infected with the Epstein–Barr virus, and those with immunodeficiency from other causes. Notable among the systemic diseases seen in immunocompromised individuals are Sjögren's syndrome and systemic lupus erythematosus. The main clinical manifestations of those two diseases include dyspnea, cough, weight loss, and chest pain. In most cases, CT shows a combination of ground-glass opacities, consolidation, peribronchovascular thickening, poorly defined nodules, and cysts. The cysts are few in number and are diffusely distributed.

Pneumocystosis is seen almost exclusively in immunocompromised patients (HIV-infected patients, bone marrow transplant recipients, and patients using immunosuppressants). Although the symptoms are insidious, including a dry cough, low-grade fever, and dyspnea, untreated cases can progress to respiratory failure and death. The combination of a positive medical history, physical examination findings consistent with the disease, lymphopenia, and elevated serum levels of lactate dehydrogenase facilitate the diagnosis. The fungus can be identified in sputum and bronchoalveolar lavage fluid. The findings on CT include extensive ground-glass opacities, with or without septal thickening. Cysts are relatively common and tend to have a predilection for the upper lobes. Pleural effusion is quite rare.

Our patient presented with a rapidly evolving pulmonary infection, hypoxemia, and elevated serum levels of lactate dehydrogenase. Given those circumstances, the most likely hypothesis was pneumocystosis. The patient underwent an HIV test, which was positive. Examination of the bronchoalveolar lavage fluid showed the presence of *P. jirovecii*, confirming the diagnosis.

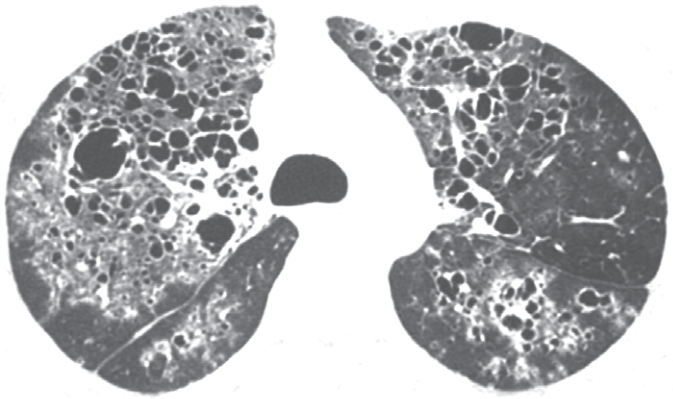

Figure 1. Chest CT. An axial slice at the level of the upper lobes, showing diffuse ground-glass opacities, in both lungs, containing multiple cystic formations.

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